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BEHAVIOR MODEL OF PREVENTION OF SOIL TRANSMITTED HELMINTH (STH) IN ELEMENTARY SCHOOL STUDENT IN THE DISTRICT OF NORTHWEST SUMBA

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Abstract: *The results of research in 2017 in West Sumba and Central Sumba District showed STH infection in elementary school children (91.0%). The highest infection prevalence was A.Lumbricoides infection 28.5%, T.Trichiura 5.9% and infection mix 65.6% in West Sumba Regency, and the highest prevalence of infection was A.Lumbricoides infection 30.0%, T.Trichiura 17 , 1% and mix infections 46.8% in Central Sumba Regency. One of the factors that influence the incidence of STH infection is the behavioral factor of elementary school children. The purpose of this study was to analyze the influence of behavior on the incidence of STH infection. This study was conducted in elementary school children in Northwest Sumba. The type and design of the study were cross sectional study, with a sample size of 105 children and a Multistage random sampling sampling technique. The independent variable of the study is the behavior of school children and the dependent variable is STH infection. Data collection techniques were carried out by the direc laboratory examination method, and interviews using questionnaires and analyzed by Chi-square and Multiple Logistic Regression. The incidence of STH infection in elementary school children in North Sumba Regency is 40%. Based on the type of STH most (38.1%) were mix of Ascariasis lumbricoides and Trichuris trichiura, Ascaris lumbricoides (31.0%), Trichuris trichiura (21.4%), Hookworm Necator americanus (7.1%) and Hookworm Ancylostoma duadenale (2.4%). Effect of eating habits on the incidence of STH p value = 0.023; OR = 7.9; (95% CI = 0.9-14.2). Effect of snack habits on the incidence of STH p value = 0.007; OR = 2.4; (95% CI = 0.8-6.72). The effect of house cleaning habits on the incidence of STH p value = 0.045; OR = 4.18; (95% CI = 1.5 - 11.65). The probability of the influence of behavior on the incidence of STH in primary school children in Sumba Barat Daya District is a factor in un cooked food habits, snacking habits and habits of cleaning the house.*

Keywords: *behavior, incidents, soil, transmitted, helminth*

I. INTRODUCTION

Worms are an infectious disease caused by worm parasites which can endanger health. Worm infections that often infect and have a very detrimental effect are infections of worms that are transmitted through the soil or often called "Soil Transmited Helmintes (STH)". STH itself is still considered not important in the community, because it is considered not to endanger or cause death. But in reality the impact of STH infection can cause a decline in health and even death[3]

Worms are found in areas with high humidity, especially in groups of people with poor personal hygiene and environmental sanitation. The most important types of worms are roundworms (Ascaris lumbricoides), hookworms (Ancylostoma duodenale and Necutor americanus) and whip worms (Trichuris trichiura)[7].

STH infection can have a very large impact on health which causes losses both directly and indirectly. Directly STH can affect the entry, absorption and metabolism of food into the body. Cumulatively STH can cause losses in the form of a decrease in calories and protein and blood loss. In addition to the disadvantages of reducing nutrients, STH can inhibit physical development, intelligence and work productivity, and can also reduce endurance and immunity so that other diseases and infections are easily attacked [5].

According to the WHO (World Health Organization) it is known that the incidence of helminthiasis in the world is still high, namely 1 billion people infected with Ascaris lumbricoides worms, 795 million people infected with Trichuris trihiura and 740 million people infected with Hookworm (Ministry of Health, 2007, WHO, 2011). According to the Ministry of Health of the Republic of Indonesia in 2006, based on the results of a survey conducted by Sub-diarrhea Subdistrict in 2002 and 2003 in 40 primary schools in 10 provinces, the prevalence of STH was around 2.2% - 96.3%. The survey conducted by the Kusuma Bangsa Foundation (YKB) in 2006-2007, the average prevalence of intestinal worms in the East Jakarta area was around 2.5% and North Jakarta at 7.8%. The 2009-2010 survey conducted in South Sulawesi Province showed an average prevalence of intestinal worms of 27.28%. In 2011 the data collected through surveys conducted in several regencies / cities, obtained a number of varied figures including, in Lebak and Pandeglang Regencies they had a fairly high average of 62% and 43.78%, then in Sleman Regency, Yogyakarta Special Region the prevalence is 21.78%, in West Lombok District and Mataram City the prevalence is 29.47% and 24.53% respectively. Finally, West Sumba District shows a prevalence of 29.56% (Directorate General of PP & PL RI, 2012). Based on these data it can be interpreted that in Indonesia is an endemic area of STH[4,5,6].

The results of the study in 2017 in West Sumba and Central Sumba Districts stated that 568 elementary school children (91.0%) were infected with STH. The highest infection prevalence was A.Lumbricoides infection 28.5%, followed by T.Trichiura infection 5.9% and infection mix 65.6% in West Sumba Regency, and the highest prevalence of infection in Sumba Tenagah District was A.Lumbricoides 30 infection, 0%, followed by T.Trichiura infection 17.1% and infection mix 46.8% [1].

One of the factors that influence the incidence of STH is the behavior of elementary school children. Play behavior is an important thing to note in relation to the conditions of home environment sanitation. The condition of a good home environment sanitation will certainly provide a sense of security and comfort for children to play. In the rural community, a child playing on the home page, in a garden with peers is a very natural thing to happen. In relation to the habit of children playing in the garden, it is necessary to watch out for the

possibility of children being exposed to hookworms who do need soil media for their breeding [9].

II. METHOD

This research is quantitative research with cross sectional design, where measurement of variables is done simultaneously between independent variables, intermediate variables and dependent variables. The study was carried out in Southwest Sumba District for elementary school children with a sample of 105 elementary school children, sampling techniques with Multisatge Random Sampling through three stages, namely the first stage of selecting elementary schools that are the farthest, medium and near or in the city, second stage withdrawal of school kulster with a simple random at the State and Private school and the third stage in a simple sampling of the sample units (elementary school children). The independent variable is the behavior of elementary school students and the dependent variable is STH infection. This study uses primary data obtained from direct interviews using questionnaires and examination of faecal examination using direct method using lugol solution. Data analysis performed a Bivariate statistical test, Chi-Square and Multivariate analysis with Multiple Logistic Regression.

III. RESULTS

Table 1. Characteristic Distribution of Respondents

Characteristic	Total	%
Age		
- 6- 12 years	104	99
- > 12 years	1	1
Gender		
- Man	35	33,3
- Woman	70	66,7
Father's Education		
- Middle down	90	85,7
- College	15	14,3
Mother's Education		
- Middle down	83	79,0
- College	22	21,0
Father's occupation		
- Not working	7	6,7
- Work	98	93,3
Mother's job		
- Not working	47	44,8
- Work	58	55,2
Family Income		
- < Provincial Minimum Wages	70	66,7
- > Provincial Minimum Wages	35	33,3
School Status		
- Private school	72	68,6
- Public school	33	31,4
Class		
- Class 1-3	67	63,8
- Class 4-6	38	36,2

Table 1 above, most (99%) of students are 6-12 years old and female (66.7%). The education level of fathers is mostly (85.7%) and maternal education (79.0%) is middle to lower. The work of fathers in general (93.3%) works and the work of mothers in part (55.2%) works and family income is mostly (66.7%) below the Provincial Minimum Wage. The school status is mostly private schools (68.6%) and the number of students is at most grades 1-3 (63.8%).

Table 2. Distribution of the incidence of STH in elementary school children in SBD

	Incident	Total	%
STH Incident	- Postive	42	40,0
	- Negative	63	60,0
STH Type	- Ascaris lumbricoides	13	31,0
	- Trichuris trichiura	9	21,4
	- Hookworm Ancylostoma duodenale	1	2,4
	- Hookworm Necator americanus	3	7,1
	- Mix AL dan TT	16	38,1

Table 2 above shows the incidence of STH of primary school children in Sumba Barat Daya Regency is 40% and the other 60% is negative STH. Based on the type of STH, most (38.1%) were mix Ascariasis lumbricoides and Trichuris trichiura, followed by Ascaris lumbricoides (31.0%) and a small portion were Ancylostoma duadenale Hookworm (2.4%).

Table 3. Distribution of Behavior of Elementary School Children in SBD District

Behavior	Total	%
Defecation habits		
- Any place	26	24.8
- Family toilet	79	75.2
Use of footwear		
- Not often	35	33.3
- yes	70	66.7
Wash hands before eating		
- Not often	40	38.1
- yes	65	61.9
Wash hands after defecating		
- Not often	34	32.4
- yes	69	56.7
Food eating habits		
- Not cooked / raw	19	18.1
- Cooked	86	81.9
The habit of drinking water		
- Not cooked	25	23.8
- Cooked / gallon	80	76.2
Land activities		
- Not often	64	61
- yes	41	39
Cut nails		
- Not often	46	43.8
- yes	59	56.2

Nail condition		
- Long / dirty	28	26.7
- Short	77	73.3
Take worm medicine		
- Not often	65	61.9
- yes	40	38.1
Home Cleaning Habits		
- Not often	41	39
- yes	64	61
How to store food		
- Open	34	32.4
- Closed / in a closet	71	67.6
Snack eating habits		
- Not often	45	42.9
- yes	60	57.1

Table 3 shows the behavior of primary school children in Sumba Barat Daya District, having defecation habits in general in family latrines (75.2%) and careless places (24.8%). The habit of using footwear / sandals outside the home generally uses sandals (66.7%) and 33.3% do not / rarely use sandals. Most hand washing habits before eating (61.9%) do hand washing and 38.1% do not / rarely wash hands. Generally, hand washing habits after defecation (56.7%) wash hands and 32.4% do not / rarely wash hands. Most food eating habits (81.9%) are cooked and 18.1% are not / rarely cooked. Most of the drinking habits of water (76.2%) are cooked / galomal and 23.8% are not / rarely cooked. Most activities (playing) with land (61%) and 39% do not / rarely play with the land. Most nail cutting habits (73.3%) and 26.7% do not / rarely cut nails. Most nail conditions (73.3%) are short and 26.7% long / dirty. Most of the habits of taking worm medicine (61.9%) did not / rarely take worm medicine and 38.1% took worm medicine. Most of the house cleaning habits (61%) clean the house and 39% do not / rarely clean the house. The habit of storing cooked foods is generally closed / in the closet (67.6%) and 32.6% open. Partial snacking habits (57.1%) and 42.9% did not / rarely eat snacks.

Table 4. Effect of Behavior on STH Incident in SBD District

No	Behavior	*STH*		Total (%)	*p* Value
		Positive (%)	Negative (%)		
1	Defecation habits				
	- Any place	20 (47,6)	6 (9,5)	26 (24.8)	0.000
	- Family toilet	22 (52,4)	57 (90,5)	79 (75.2)	
2	Use of footwear				
	- Not often	23 (54,8)	12 (19,0)	35 (33.3)	0.000
	- yes	19 (45,2)	51 (81.0)	70 (66.7)	
3	Wash hands before eating				
	- Not often	26 (61,9)	14 (13.3)	40 (38.1)	0.000
	- yes	16 (38,1)	49 (77,8)	65 (61.9)	
4	Wash hands after defecating				
	- Not often	24 (57,1)	10 (15,9)	34 (32.4)	0.000
	- yes	18 (42,9)	51 (81,0)	69 (65.7)	

5	Food eating habits				
	- Not cooked / raw	18 (42,9)	1 (1.6)	19 (18.1)	
	- Cooked	24 (57,1)	62 (98.4)	86 (81.9)	0.000
6	The habit of drinking water				
	- Not cooked	19 (45,2)	6 (9,5)	25 (23.8)	0.000
	- Cooked / gallon	23 (54,8)	57 (90,5)	80 (76.2)	
7	Land activities				
	- Not often	31 (73,8)	33 (52,4)	64 (61.0)	0.027
	- yes	11 (26,2)	30 (47,6)	41 (39.0)	
8	Cut nails				
	- Not often	27 (64,3)	19 (30,2)	46 (43. 8)	0.001
	- yes	15 (35,7)	44 (69,8)	59 (56.2)	
9	Nail condition				
	- Long / dirty	22 (52,4)	6 (9,5)	28 (26.7)	0.000
	- Short	20 (47,6)	57 (90,5)	77 (73.3)	
10	Take worm medicine				
	- Not often				
	- yes	26 (61,9)	39 (61,9)	65 (61.9)	1.000
		16 (38,1)	24 (38,1)	40 (38.1)	
11	Home Cleaning Habits				
	- Not often				
	- yes	26 (61,9)	15 (23,8)	41 (39.0)	0.000
		16 (38,1)	48 (76,2)	64 (61.0)	
12	How to store food				
	- Open	24 (57,1)	10 (15,9)	34 (32.4)	0.000
	- Closed / in a closet	18 (42,9)	53 (84,1)	71 (67.6)	
13	Snack eating habits				
	- Not often	31 (73,8)	14 (22,2)	45 (42.9)	
	- yes	11 (26,2)	11 (77,8)	60 (57.1)	0.000

Table 4. above shows the influence of schoolchildren behavior including bowel habits, habit of using footwear / sandals, hand washing habits after defecation and hand washing habits before eating, eating habits, drinking habits of water results of the Chi-Square statistical test show p value = 0,000 <α 0,05, there is a significant effect of defecation habits, the habit of using footwear / sandals, hand washing habits after defecation and hand washing habits before eating, eating habits, drinking water habits against the incidence of STH. Effect of activity (playing) with soil p value = 0.027 <α 0.05, there is a significant effect of activity (play) with soil on the incidence of STH. The effect of nail cutting habits p value = 0,000 <α 0,05, there is the influence of the habit of cutting nails with the incidence of STH. The effect of house cleaning habits, how to store food and snacking habits p value = 0,000 <α 0,05, there are significant effects of cleaning habits, how to store food and snack habits on the incidence of STH. The effect of the habit of drinking worm medicine p value = 1,000> α 0,05, there is no effect of the habit of taking worm medicine on the incidence of STH.

Table 5. Behavior Prevention Model of STH in Primary School Children in SBD District

Variable	B	P value	Exp.B (OR)	95 %CI	
				Lower	Upper
Food eating habits	-2.540	0.023	7.9	0.9	14.2
Snack eating habits	-1.425	0.007	2.4	0.8	6.72
Home Cleaning Habits	-0.873	0,045	4.18	1.5	11.65
Constant	1.758	0.000	5.801		

Table 5 above shows the results of statistical tests Multiple logistic regression of the "in the equation" variable can be seen the coefficient value of each variable in column B, the p value in the sig column, so it can be concluded that the significant variables for the final model are eating habits, snacking habits and the habit of cleaning the house simultaneously or jointly influencing the incidence of STH infection in elementary school children in Sumba Barat Daya District.

The results of the statistical tests showed that the eating effect was p value = 0.023 <α 0.05, so there was a significant effect of eating habits on the incidence of STH, with OR = 7.9 showing un cooked / raw eating habits having a 7.9 times the risk of STH. The effect of snacking habits p value = 0.007 <α 0.05, then there is a significant effect of snack habits on the work in STH, with OR = 2.4 indicating snacking habits have a 2.4 times the risk of STH. The effect of house cleaning habits p value = 0.045 <α 0.05, there is a significant effect of house cleaning habits on the incidence of STH, with OR = 4.18 indicating the habit of not / rarely cleaning the house having the risk of STH occurrence 4.18 times.

IV. DISCUSSION

The results showed that 40% of elementary school children in West Sumba Daya Regency were infected by Soil Transmitted Helminth (STH), in contrast to the results of Mau's research, Fridolina (2017) which stated that 91.0% of elementary school children in West Sumba and Central Sumba were infected with Soil Transmitted Helminth (STH). Based on the results of the examination, the most common types of worms were Ascaris lumbricoides (31%) and Trichuris trichiura (21.4%). When compared with Mau's research results, Fridolina, the highest prevalence was A.Lumbricoides infection 28.5%, followed by T. Trichiura infection 5.9% .1 This study was not much different from the study in Palu, where 39 worm eggs were found. 8%. STH worm egg species found were Ascaris lumricoides 70.2%, Hookworm 16.2%, mixture of Ascaris lumricoides and Hookworm 10.8%, Ascaris lumricoides and Trichuris trichiura 2%. Differences in the number of STH infections in Sumba Barat and Sumba Districts Central with Southwest Sumba Regency because school children in Sumba Barat Daya Regency routinely get anti-helminth drugs from the puskesmas even though there are still infected children. It was different from Hairin's study of 292 samples, 18 children (6.16%), who were positively infected with worms. Boys are more infected than girls[11].

The incidence of helminthiasis in elementary school students in Pekanbaru's Rumbai Pesisir District was 16.3%. Types of Ascaris lumbricoides 13.0%, Trichuiris trichiura 2.5% and Mine worms 0.8%. Variables related to helminthiasis: taking worm medicine 11,143 times worms, hand washing habits 5,366 times worms, SPAL2,615 availability of worms and hygiene nails 2,378 times the worms 12 Berebda with research conducted SDN 1-4 Muara Laung Village, Central Kalimantan there were no worm eggs (0.0%) in elementary school children.[8]

STH incidence in Sumba Barat Daya Regency is inseparable from personal hygiene factors that are less noticed such as not wearing footwear when outdoor activities, not washing hands and feet after direct contact with the soil / after defecating or before eating, the habit of playing on the ground, nails that are rarely cut and direct contact with playmates, snacking habits so the worm eggs move easily. The results of a different study were conducted at Abe Pantai Jayapura Elementary School students, where there was no personal hygiene relationship with helminthiasis.10 In contrast to the results of a study conducted in Lhokseumawe, it was shown that hand washing habits had a significant influence on the incidence of helminthiasis, in which students had washing habits bad hands have a 2.9 times chance of getting infected with worms compared to students who have good hand washing habits[13]

The results of the study showed that the behavior model for eating habits was not cooked, snack habits and the habit of cleaning the house simultaneously or together had an effect on the incidence of STH infection in elementary school children in Sumba Barat Daya District. This research is the same as the research in Palu where the results of basil examination based on species of worm eggs found in basil broiled fish traders in the area of Palu City.[2]

V. CONCLUSION AND RECOMMENDATION

4.1 Conclusion

The incidence of Soil Transmitted Helmith (STH) in elementary school children in West Sumba Regency is influenced by behaviors such as bowel habits, habit of using footwear / sandals, hand washing habits after defecation and hand washing habits before eating, habits eating, and drinking water habits. 2) The model for eating habits that are not cooked, snacking habits and the habit of cleaning the house simultaneously or jointly affect the incidence of STH infection in elementary school children

4.2 Recommendation

Health Service and Health Center for West Sumba Regency: To reduce the incidence of Soil Transmitted Helminth, it is necessary to conduct health promotion on Clean and Healthy Life Behavior (PHBS) regularly in schools. 2). Empowering School health teachers to guide school children about personal hygiene.

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